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Northwest Pipe and Casing Company

Clackamas, Oregon
CERCLIS #ORD980988307

Site Exposure Potential

The 21-hectare Northwest Pipe and Casing Company site in Clackamas, Oregon is about 5.5 km east of the Willamette River (Figure 1). The site is near Deer Creek, which flows into Mt. Scott Creek 2.4 km downstream of the site. Mt. Scott Creek flows 3.2 km northwest into Kellogg Creek, which discharges to Kellogg Lake 2 km farther downstream (Figure 2). Kellogg Lake is 1 km long and discharges to the Willamette River. The Willamette River flows north 30 km into the Columbia River; the Columbia River discharges directly to the Pacific Ocean an additional 160 km downstream.

From 1956 to 1985, pipe-coating operations were conducted at the site. Waste materials from site operations included coal tar, coal tar epoxy, cement mortar and slurry, asphalt, and bitumastic jet primer. Unknown amounts of these waste materials were burned, spilled, or buried on the site. Drums of waste oils and solvents may also have been buried on the site, and there is a pile of waste material in the northwestern portion of the site (Ecology and Environment, Inc. 1990).

Surface water runoff, groundwater, and direct discharge are the potential pathways of contaminant transport from the site to NOAA resources and associated habitats. Drainage ditches along

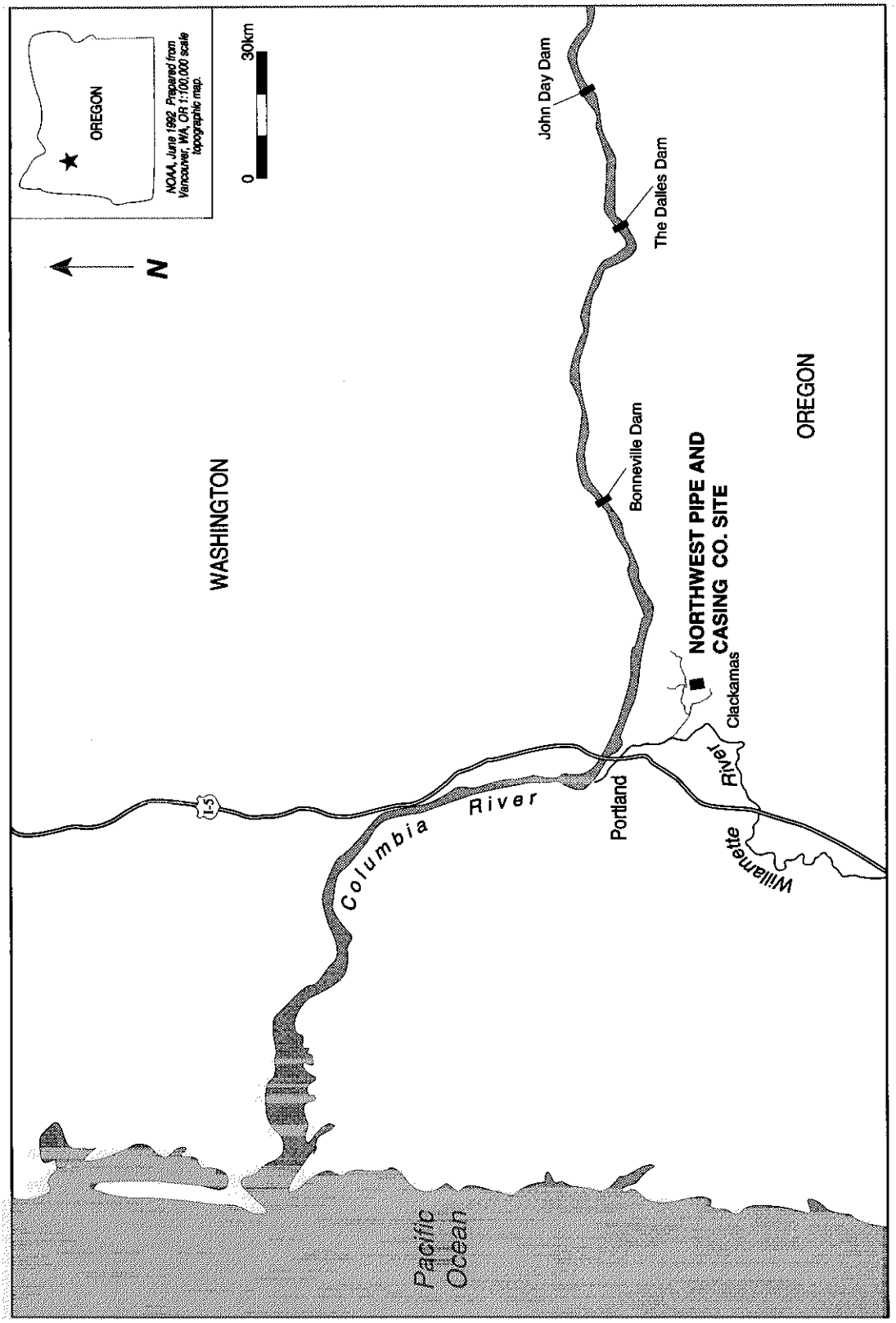

Figure 1. Northwest Pipe and Casing Company, Clackamas, Oregon.

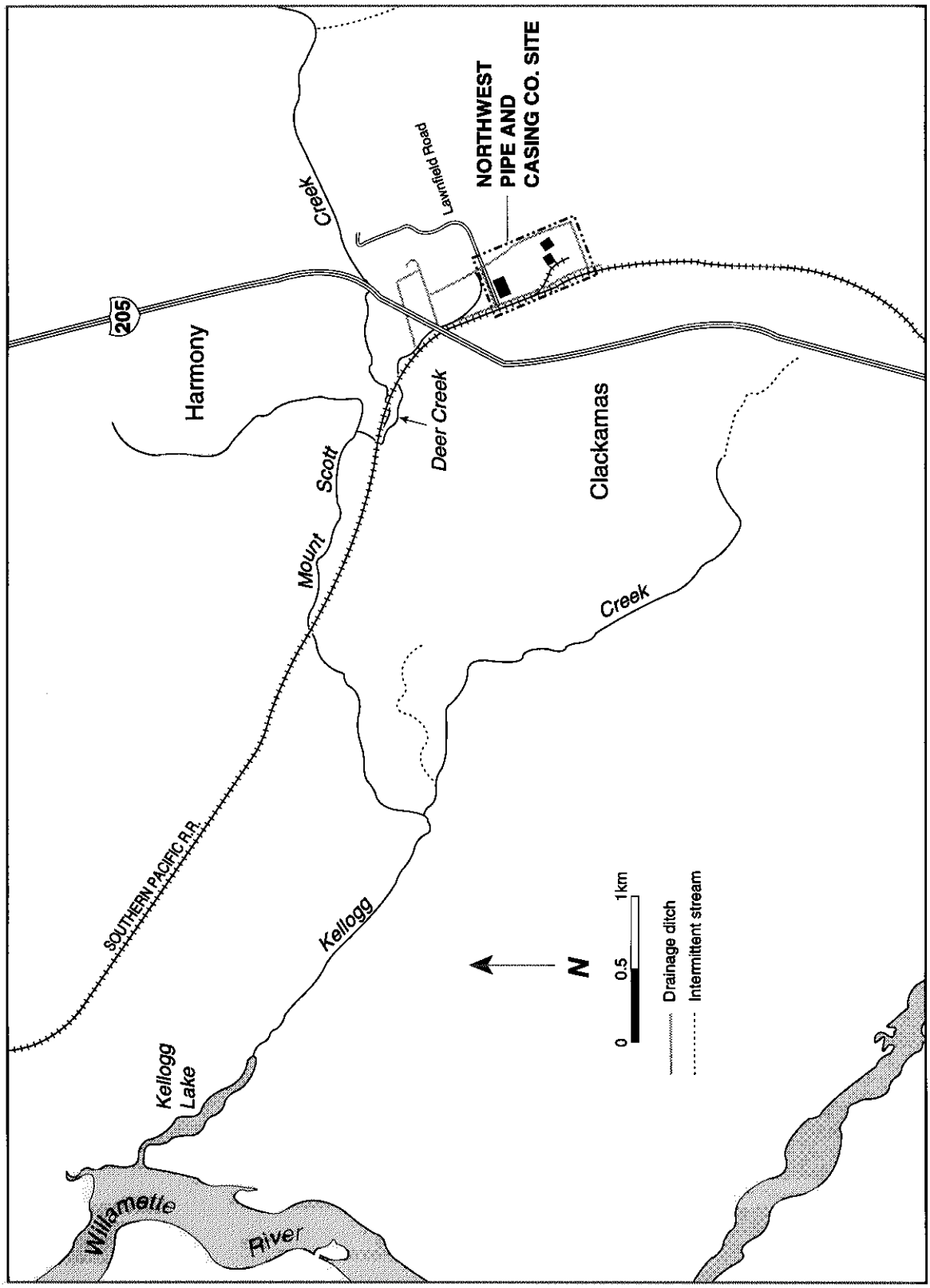

Figure 2. Features of the Northwest Pipe and Casing Company site.

the western and eastern site boundaries (Figure 2) receive surface water runoff from the site. Water in these ditches flows north, reportedly discharging to Deer Creek 75 m north of the site. A low-lying area in the southwest corner of the site is also reportedly subject to flooding, and surface water discharged to a floor drain in an on-site warehouse drains directly to the ground beneath the building. Groundwater is 11 to 60 m below ground surface; information on the number and types of aquifers was not available. However, shallow groundwater is subject to artesian conditions, and may be within 1 m of ground surface. Shallow groundwater flows primarily northwest from the site toward Deer and Mt. Scott creeks, but a small component of groundwater flows southwest (Ecology and Environment, Inc. 1990).

There may also have been direct discharges to on-site surface water. A former pond and swamp area reportedly existed in the central portion of the site; waste products generated during site operations may have been used as fill material, although information was not available on historical discharge points for these surface water features. In addition, at least one drum with unknown contents was observed partially submerged in a pond near the western site boundary, but the exact location of the pond or its discharge point was not available (Ecology and Environment, Inc. 1990).

NOAA Trust Habitats and Species

The habitats of primary concern to NOAA are the surface water and associated bottom substrates of Deer Creek, Mt. Scott Creek, Kellogg Creek, and Kellogg Lake. Secondary habitats of concern are the surface water and associated bottom substrate of the Willamette River. The creeks and river provide habitat for some anadromous and resident NOAA trustee species, many of which are likely to migrate close to the site and reside there for extended periods during sensitive life stages (Table 1; Massey personal communication 1992; Melcher personal communication 1992; Ward personal communication 1992).

Deer, Mt. Scott, and Kellogg creeks have low-velocity flow and primarily gravel and sand substrates. A dam equipped with fish passage facilities at the confluence of Kellogg Lake and Kellogg Creek allows anadromous species to migrate upstream. Mt. Scott and Kellogg creeks provide spawning, nursery, and adult habitat for anadromous steelhead trout and coho salmon and resident cutthroat trout (Massey personal communication 1992). These anadromous and resident species probably also use Deer Creek near the site.

Other significant anadromous species in the Willamette River include white sturgeon, Pacific lamprey, chinook salmon, and American shad (Ward personal communication 1992). These species are known to use the Willamette River as a

Table 1. Fish species present in Deer Creek, Mt. Scott Creek, Kellogg Creek, Kellogg Lake, and the Willamette River near the Northwest Pipe and Casing Company site.

Species		Habitat				Fisheries	
Common Name	Scientific Name	Spawning Ground	Nursery Ground	Migration Route	Adult Forage	Comm.	Recr.
ANADROMOUS SPECIES							
White sturgeon	*Acipenser transmontanus*		♦	♦	♦		
American shad	*Alosa sapidissima*		♦	♦	♦		
Pacific lamprey	*Lampetra tridentatus*				♦	♦	
Coho salmon[1]	*Oncorhynchus kisutch*	♦	♦	♦			
Steelhead trout[1]	*Oncorhynchus mykiss*	♦	♦	♦			
Sockeye salmon	*Oncorhynchus nerka*		♦	♦			
Chinook salmon	*Oncorhynchus tshawytscha*	♦	♦	♦			
RESIDENT SPECIES							
Cutthroat trout[1]	*Oncorhynchus clarki*	♦	♦	♦			

[1]Species known to be present in Mt. Scott Creek, Kellogg Creek, and Kellogg Lake; likely to be present in Deer Creek.

migratory corridor to upstream spawning grounds. Out-migrating juvenile salmonids use the Willamette River near the site as nursery habitat.

Deer Creek, Mt. Scott Creek, Kellogg Creek, and Kellogg Lake are protected spawning habitat for coho salmon and steelhead trout. These habitats are restricted year-round to all recreational and commercial fishing for these species. Cutthroat trout are fished recreationally in the vicinity of the site. The Willamette River supports an important recreational fishery for salmon, steelhead trout, white sturgeon, and American shad. Although there is no commercial fishing near the site, there is a small commercial fishery for pacific lamprey in the Willamette River (Melcher personal communication 1992).

Site-Related Contamination

Data collected during preliminary site investigations indicate that on- and off-site soils, groundwater, surface water, and sediments contain elevated concentrations of site-related contaminants (Ecology and Environment, Inc. 1990). The primary contaminants of concern to NOAA are trace elements, PCBs, and PAHs. Maximum concentrations of these inorganic substances and organic compounds are summarized in Tables 2 and 3, along with applicable screening guidelines.

Elevated concentrations of copper, lead, and zinc were detected in soil, groundwater, surface water, and sediment. These concentrations frequently exceeded their respective screening guidelines

Table 2. Maximum concentrations of contaminants of concern in soils and sediments (mg/kg) at the Northwest Pipe and Casing Company site.

	Soil				Sediment						
					Drainage Ditches				Mt. Scott Creek		
	On-site	Off-site	Site back-ground	Ave. U.S.[1]	Up-stream	On-site	Down-stream	Deer Creek	Up-stream	Down-stream	ER-L[2]
INORGANIC SUBSTANCES											
Trace Elements											
Arsenic	13	4.8	2.5	5	3.4	12	7.5	5.1	9.4	4.9	33
Chromium	120	40	29	100	31	42	24	30	59	27	80
Copper	160	35	21	30	370	78	92	32	23	27	70
Lead	28	74	20	10	540	180	120	12	13	29	35
Mercury	<0.12	<0.13	<0.13	0.03	<0.15	0.23	<0.13	<0.22	0.16	<0.17	0.15
Nickel	99	24	20	40	17	24	19	21	41	22	30
Zinc	810	203	78	50	200	1,200	270	290	160	150	120
ORGANIC COMPOUNDS											
PCBs											
Aroclor 1254	1,000	ND	<1.0	NA	4.3	1.2	2.5	0.10	<0.44	<0.51	0.05*
PAHs											
Total PAHs	18	2.8	ND	NA	7.5	13	26	<1.0	<0.92	0.34	4.0

1: Lindsay (1979).
2: Effects range-low; the concentration representing the lowest 10 percentile value for the data in which effects were observed or predicted in studies compiled by Long and Morgan (1990).
*: Criteria presented is for total PCBs.
NA: Screening level not available.
ND: Not detected; detection limit not available.
<: Not detected at detection limit shown.

(Lindsay 1979; U.S. EPA 1986; Long and Morgan 1990). Concentrations of these trace elements generally decreased with distance from the site, although copper and zinc were the only trace elements detected at high concentrations in surface water or sediment of Deer Creek and Mt. Scott Creek downstream of the site. Other trace elements (arsenic, chromium, mercury, and nickel) were occasionally detected in on- and off-site soil, groundwater, surface water, and sediment at concentrations exceeding screening guidelines.

Concentrations of trace elements in background soil, groundwater, surface water, and sediment samples were quite variable. Background soil samples collected immediately southwest of the site had high concentrations of lead and zinc. Given that the southwestern corner of the site is reportedly subject to flooding and that some component of shallow groundwater flows southwest from the site, these soils may not be representative of background conditions. Trace elements were not detected at concentrations exceeding screening criteria in groundwater samples collected from upgradient monitoring wells or in surface water samples collected from Mt. Scott Creek upstream of its confluence with Deer Creek. Background sediment samples were collected from drainage ditches near the eastern

Table 3. Maximum concentrations of contaminants of concern in groundwater and surface water(µg/l) at the Northwest Pipe and Casing Co. site.

	Groundwater				Surface Water						
					Drainage Ditches			Deer Creek	Mt. Scott Creek		AWQC[1]
	Up-grad.	On-site	Down-grad.	Floor Drain	Up-stream	On-site	Down-stream		Up-stream	Down-stream	
INORGANIC SUBSTANCES											
Trace Elements											
Arsenic	ND	13	ND	<4.4	<4.4	<4.4	<4.4	<4.4	<4.4	<4.4	190
Chromium	9.7	290	<3.0	110	<4.1	<7.6	<4.4	<4.0	6.0	<5.0	11
Copper	28	330	28	260	<3.0	32	<3.0	<3.0	<3.0	21	12+
Lead	20	64	5.0	490	<4.6	65	<1.1	<1.3	<1.3	<2.3	3.2+
Mercury	ND	ND	ND	ND	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.012
Nickel	ND	160	ND	75	<16	<16	<16	<16	<16	<16	160+
Zinc	260	1,200	2,300	4,800	38	220	61	110	37	54	110+
ORGANIC COMPOUNDS											
PCBs											
Aroclor 1254	ND	15	ND	3.3	ND	ND	ND	ND	ND	ND	0.03*
PAHs											
Total PAHs	ND	17,000	ND	95	ND	ND	ND	ND	ND	ND	NA

1: Ambient water quality criteria for the protection of aquatic organisms. Freshwater chronic criteria presented (U.S. EPA 1986).
+: Hardness-dependent criteria (100 mg/l $CaCO_3$ used).
*: Criteria presented is for total PCBs.
grad: Gradient.
NA: Screening level not available.
ND: Not detected; detection limit not available.
<: Not detected at detection limit shown.

site boundary and Mt. Scott Creek upstream of its confluence with Deer Creek. The background sediments collected from the drainage ditches had high concentrations of copper, lead, and zinc. Because of the proximity of these drainages to the site, these sediments may not be representative of background conditions.

PCBs (primarily Aroclor 1254) were measured in on-site soil and groundwater samples at concentrations exceeding screening guidelines. Concentrations of PCBs in sediments collected from the on-site drainage ditches and Deer Creek exceeded the ER-L value. PCBs were not detected in sediments from Mt. Scott Creek, but detection limits were greater than the screening guideline.

PAHs were measured in on-site soils, but screening guidelines were not available. Concentrations of individual PAHs measured in on-site groundwater did not exceed ten-times chronic AWQC. PAHs were measured at a total concentration of 17,000 µg/l in on-site groundwater, but no screening criterion for total PAHs was available.

PAHs were not detected in soils or groundwater collected from off-site sampling locations. Concentrations of total PAHs in sediments from the on-site drainage ditches exceeded their ER-L value. PAHs were not detected in sediments collected downstream of the site in Deer and Mt. Scott creeks.

Summary

Trace metals, PCBs, and PAHs are discharged directly to on-site surface water. On- and off-site soil, groundwater, surface water, and sediment contain concentrations of copper, lead, zinc, PCBs, and PAHs above screening guidelines. Arsenic, chromium, mercury, and nickel were occasionally detected above screening guidelines. PCBs and PAHs exceeded ER-L guidelines in on-site soil, sediments and groundwater samples. Mt. Scott and Kellogg creeks are important habitats for trust species: coho salmon, steelhead trout, and resident cutthroat trout use these areas for spawning, nursery, and forage. Deer Creek, Mt. Scott Creek, Kellogg Creek, and Kellogg Lake are protected spawning habitat for coho salmon and steelhead trout. Levels of contaminants in these receptor habitats have not been measured.

References

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